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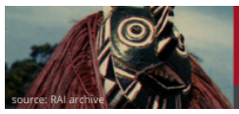

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Policy Approaches Addressing the Ongoing Humanitarian and Environmental Consequences of Nuclear Weapons: A Commentary

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Abstract

The 2017 Treaty on the Prohibition of Nuclear Weapons (TPNW) not only bans nuclear weapons, it obligates its states parties to engage in assisting victims and remediating contaminated environments (Articles 6 and 7). As states and civil society consider the best methods to implement these provisions, it is important to take stock and review existing policy approaches addressing the ongoing humanitarian and environmental consequences of nuclear weapons. This practitioner commentary, written by members of the International Campaign to Abolish Nuclear Weapons (ICAN), which was awarded the 2017 Nobel Peace Prize for its advocacy for the TPNW, reviews existing programs of victim assistance and environmental remediation. It highlights key considerations for policy makers seeking to improve on the existing mechanisms.

Victim assistance

Current assistance programs for victims of nuclear weapons use and testing have provided compensation or other benefits to individuals in about a dozen countries around the world, including in the United States, the Marshall Islands, Japan, France, Canada, Australia, New Zealand, Fiji, Russia, Kazakhstan, India and China. All but one of these cases – Japan – deals with victims from the era of nuclear weapons testing.

Some of these programs offer meaningful assistance, but most cases require improvements to appropriately meet the needs of victims from the full range of impacted communities, in particular marginalized populations. Nonetheless, they present valuable lessons and questions as future assistance programs are considered. There is no single best practice for providing victim assistance, and much more work needs to be done to extend the benefits of these programs to all who have suffered.

Proactive versus reactive support

One of the primary questions facing victim assistance programs is whether they are to provide assistance in reaction to a particular event, like an illness diagnosis, or whether they provide proactive support. Most programs are designed to respond to illness, including existing or past compensation programs in the United States, France, and the Marshall Islands. Some, however, have provided support to anybody who lived in the affected area or to all veterans who participated in a test, regardless of health status. Japan provides wide-ranging medical support for the *hibakusha*, the survivors of the nuclear bombings of Hiroshima and Nagasaki, based on their proximity to the blast (Ministry of Health, Labour and Welfare, 2019). Kazakhstan also provides tiered support based on how close its residents lived to the Semipalatinsk testing site (Vakulchuk et al., 2014).

Eligibility criteria

There are two general approaches for determining eligibility that existing programs have applied. Some have used a causal presumption approach, which assumes that an individual has been impacted and deserves assistance based on meeting identified criteria, for example, presence in a particular place at a particular time plus a diagnosis of an illness related to exposure to ionizing radiation. This approach is simpler to understand and easier to administer, but it draws hard categorical boundaries. By its nature, it will include some just within the boundaries and exclude others just on the other side. While science can provide a base understanding for drawing lines, these decisions can come down to political factors. When geographic or temporal boundaries are drawn, communities with greater political clout may be more likely to receive benefits while marginalized communities may be excluded.

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The second approach is to use a more technical, scientific formula that seeks to measure exposure and the likelihood that this exposure has led to health issues, with individuals above an established threshold receiving assistance. While this approach appears more equitable in theory, it raises serious challenges in practice due to the lack of available data and evidence for affected individuals to prove their claims. In 2005, a US scientific panel recommended this approach as more science-based and equitable, but acknowledged that it would lead to fewer successful claims than the existing presumptive approach (National Research Council, 2005).

Notably, France's program started out by using the latter, more technical approach, due to a line in the enabling statute about needing to prove that radiation exposure caused more than a "negligible risk" (Loi no. 2010-2 du 5 janvier 2010). However, this application resulted in claim approval rates of less than 10 per cent, leading to widespread frustration with the program (Association Nationale des Vétérans Victimes des Essais Nucléaires, 2015). In 2017, the program was amended to remove the 'negligible risk' language, though maintaining a threshold minimum exposure to guide judgements. While questions still remain about program application, initial data show that claim acceptance rates rose above 50 per cent in 2018 (Comité d'indemnisation des victimes des essais nucléaires, 2018).

Type and duration of assistance

Australia, the United States, France, and the Marshall Islands have provided one-time financial compensation to individuals with certain illnesses. Canada, Fiji and the Isle of Man in the United Kingdom have provided one-time financial awards to veterans who participated in nuclear tests; some veterans also get pension payments related to their service. India provided minimal one-time compensation to residents with property damaged by its tests. China provides ongoing compensation to its test veterans. Russia provides ongoing compensation in the form of various social benefits to test veterans and residents in the Altai region, on the border of Kazakhstan and close to the Semipalatinsk test site. Kazakhstan also provides ongoing social benefits. Japan provides ongoing specialized health care coverage for the *hibakusha*. Health insurance is mandatory in Japan, but patients usually must cover a small percentage of the cost. In 2017, Australia recently began providing nuclear test veterans and other affected individuals with medical care. Australia offers universal health care based on a single-payer system but some health costs are usually not covered.

Ongoing programs may have a better chance of meeting the ongoing needs of affected individuals, but also require more robust program structure or bureaucracy. The most substantial program in terms of cost is Japan's efforts to care for *hibakusha*, which since 1957 has cost 5.7 trillion yen ($52.3 billion) (Ministry of Health, Labour and Welfare, 2019). As of March 2019, there were 135,507 hibakusha receiving benefits (Ministry of Health, Labour and Welfare, 2019). The United States' Radiation Exposure Compensation Act (RECA), by comparison, has provided about $2.3 billion in compensation to 36,000 individuals diagnosed with illnesses linked to radiological poisoning (The United States Department of Justice, 2019).

Although many programs have one-time benefit awards, costs may change over time. Under the US RECA program, the award amounts have remained the same over a 30-year period; general inflation has cut the value of these awards essentially in half (and health care costs may have risen at an even higher rate).

Does the assistance account for multi-generational harm? This question will only become more important as first-generation victims from the Second World War and the subsequent era of nuclear testing age and pass away. There is growing concern that the harm caused by radiation exposure gets passed down to future generations, whether as a result of genetic transmission or psychological strain on families (Yan, 2019). Kazakhstan provides healthcare for children born in affected areas, but no other programs recognize and compensate for the harm caused directly on second-generation survivors. Some existing programs provide benefits to family members in the case of death of the primary victim.

Distribution equity

For existing programs, countries have often started with benefits to veterans. However, once benefits have been offered to veterans, it becomes harder to deny them to civilian populations, although some countries like China still only provide compensation for veterans.

Affected populations have not all received equitable victim assistance. Most often, tests were conducted close to already marginalized groups, including colonized or Indigenous populations. Under the French program, for example, statistics from early 2019 showed that only one Algerian has received compensation over the last decade (Comité d'indemnisation des victimes des essais nucléaires, 2018). While the US has provided funding for the RECA program for its own citizens, it has not provided adequate funding for Marshallese seeking compensation under the Nuclear Claims Tribunal established by those two countries in the mid-1980s (Nuclear Claims Tribunal Republic of the Marshall Islands, 2006). As a result, the Tribunal ran out of funding more than 10 years ago.

Responsibility accepted

Most nuclear-weapon states are hesitant to accept responsibility for illnesses caused by nuclear testing. The United Kingdom refuses to recognize any health impacts from nuclear tests or provide any special compensation for its nuclear test veterans or other affected populations. The United States, on the other hand, included an official and explicit apology to its own citizens in its 1990 RECA legislation (Radiation Exposure Compensation Act, 1990). To citizens of the Marshall Islands, however, the US stated it had a responsibility for the nuclear tests rather than apologizing (Joint Resolution, 1986). France has recently recognized the contributions of French Polynesia to its nuclear program – and that these contributions were not voluntary – but has not explicitly apologized to that territory or Algeria (Loi organique no. 2019-706, 2019). Other countries, for example Canada, have provided payment to veterans on an *ex gratia* basis, meaning it is given out of good will, not legal or moral responsibility (Government of Canada, 2008).

Key takeaways

Roughly a dozen states in advance of the entry into force of the TPNW have already taken steps to provide monetary or health assistance for victims of nuclear weapons use and testing. In reviewing these existing programs, it is clear that while having victim assistance programs is better than not, significant gaps exist in their implementation, leaving some vulnerable populations without help. Double standards in assistance continue to exist and should be eliminated. Transparency and clarity of eligibility processes are important, as is placing a special emphasis on supporting marginalized communities where trust in government efforts is understandably low. Requiring individuals to prove a causal connection through legal or other formal processes presents a significant barrier for most victims, especially those without resources. Offering a presumption of causation or placing a burden to disprove on a government, which controls access to relevant data, may lead to a more balanced system. Finally, although apology or acknowledgment of responsibility by nuclear-armed states is not necessary for providing material assistance, it remains one of the demands from many victims and their families (BBC News, 2018; Lewis, 2015).

Environmental remediation

In reviewing more than 75 sites around the world that have been contaminated by nuclear weapons use, testing and production, it is clear that there is no common regulatory standard to clean them up. In preparing this commentary we reviewed five case studies in detail: a former plutonium factory in Rocky Flats, Colorado in the United States, a former nuclear test site at Enewetak Atoll, in the Republic of the Marshall Islands, a former nuclear test site at Maralinga in Australia, the site of a major nuclear accident around Mayak in Russia and two former French nuclear test sites in Reggane and Ekker, Algeria. They highlight elements to consider when designing future environmental remediation programs.

Threshold of remediation and monitoring of radiation levels

Numerous subnational, national, and international bodies set different regulatory standards for human health. This leads to the application of different standards for different projects. Moreover, some populations are more vulnerable to the health effects of exposure to ionizing radiation, through biological or behavioral factors. A one-size fits all threshold does not work, even though it is often applied. A 2019 review of the literature noted that the common practice of basing standards on adult male bodies will lead to increased potential harm for women, boys and girls (Olson, 2019). For populations whose lifestyles involve hunting and camping in contaminated areas, there may be particular risk (O'Neill, 1994).

In situations where states have tested weapons now under the control of other sovereign entities, the different parties can use different thresholds that meet their own interests. For example, claiming full environment remediation under a less stringent standard allows nuclear testing states to shirk further responsibility.

Disposal of radioactive waste

The disposal of highly radioactive waste in the long-term, in particular whether it is kept at its original location or moved to another, is another highly disputed question in environmental remediation. As some radioactive elements have very long half-lives, these waste dumps will last for more than 100,000 years. This problem exists for all countries with nuclear waste, whether it stems from military or civilian applications. The best solution that governments have come up with is to create a storage facility deep underground in which it can store solid waste, although, according to a new World Nuclear Waste Report, Finland is the only country to have started construction of such a facility (Besnard et al., 2019). Not surprisingly, local communities usually oppose the idea of such facilities near their homes. An inherent tension exists between responding to local populations and finding a long-term storage facility for at least the next 100 years.

In Enewetak atoll, radioactive waste was dumped into a crater on Runit Island and capped with a concrete dome. The Runit Dome currently shows signs of structural weakness; the US government now contends that the crater was built to store the debris, not protect the nearby environment from its contents (Rust, 2019).

Speed, thoroughness and cost of remediation

The speed and thoroughness of environmental remediation programs vary considerably, as does report cost, which ranges from millions of dollars to billions.

The cleanup program at Rocky Flats in Colorado in 1995 was estimated to cost $37 billion and take 70 years, but a revised plan cut down both the cost and timeline (Clark et al., 2006). In the end, the cleanup effort cost about $10 billion (in 2005 dollars) and finished in 2005 (Government Accountability Office, 2006). The contractor received about $630 million in fees for its work on the project. The cleanup work consisted of demolishing buildings and shipping contaminated waste off-site. One reason the cleanup could proceed faster, according to a Government Accountability Office report, is that the site primarily had contaminated soil, which is much easier to package and ship off-site than contaminated groundwater. Some researchers counter that fast cleanup may be due to the fact that it was not a comprehensive job (The Associated Press, 2019).

The US government spent about $105 million on cleanup activities at the Enewetak atoll in the 1970s, during which six men died (*The New York Times*, 1983). The US military published a 700+ page report on these activities (Defense Nuclear Agency, 1981). The *Los Angeles Times* summarizes the cleanup as follows: 'It took 4,000 U.S. servicemen three years to scoop up 33 Olympic-sized swimming pools' worth of irradiated soil and two Olympic swimming pools' worth of contaminated debris from islands across the atoll and dump it into the crater on Runit Island. Much of it was mixed in a slurry of concrete and poured into the pit, which was eventually capped with a concrete dome' (Rust, 2019).

At Maralinga, Australia, the British originally conducted three organized cleanups in 1963, 1964, and 1967 and declared the site to be safe, on the basis of a 1968 report by British physicist Noah Pearce. However, after a series of studies in the 1980s revealed that contamination was much worse than the Pearce report claimed, in 1991 the South Australian Government, the Commonwealth Government, and the Aboriginal community agreed on another cleanup plan. The Australian government conducted its own cleanup from 1995–2000 for just over AUD100 million, about half of which was paid by the United Kingdom (Maralinga Rehabilitation Technical Advisory Committee, 2003). While the government formally claimed that cleanup was completed successfully and to a high standard, some have questioned this (Parkinson, 2002).

In 2016, the Russian nuclear agency Rosatom approved a Strategic Master Plan for the long-term environmental remediation of the Techa River Cascade. Rather than taking an active approach, the plan envisions designating certain reservoirs as waste storage facilities as radioactive materials gradually decay over the next 180 years (Digges et al., 2019).

At the two former French test sites in Algeria, while Algerian representatives have stated a desire to do more, virtually no additional environmental remediation has been performed at either site (Simohamed, 2011).

Access to site

Sites that have what countries deem to be completed environmental remediation programs are still somewhat closed off to residents.

A portion of the Rocky Flats site recently opened to the public as a wildlife refuge, although the core of the site remains fenced and off-limits (The Associated Press, 2019). Environmental groups have argued the entire site should remain closed (McMahon, 2018). The site continues to be tested for contamination; in August 2019 an isolated soil sample revealed a level of plutonium above the cleanup threshold, but subsequent additional testing showed this test sample to be an outlier (Aguilar, 2019a, 2019b).

The residents of Enewetak Atoll were allowed to return in 1980 to a few of the southern islands in the atoll, but with unrealistic usage restrictions (Johnston, 2016). As a result, the returned inhabitants of Enewetak face many obstacles to viable living conditions.

In 2009, remediated land was formally handed back from the Australian government to the Maralinga Tjarutja community; reactions were mixed at that time as to whether the land should be considered safe. Tourists may now access parts of the site through guided tours.

Following a 1957 tank explosion of nuclear materials near Mayak, Russia, two dozen villages, home to 10,000 people, were permanently evacuated (Ayres, 2018).

Around two former French nuclear tests sites in Algeria, the Algerian government constructed a large fence around the most contaminated portion of the In Ekker site (Makhijani et al., 2008).

Remediation of extraterritorial sites

When nuclear tests were conducted on a former colony's land, environmental remediation has been largely paid for and carried out by the nuclear-armed state that tested weapons there, although local governments have also taken some steps in many cases.

At Enewetak Atoll in the Marshall Islands, the US government directed and paid for the cleanup and established a joint tribunal to consider claims from the inhabitants of Enewetak for loss of use, restoration costs, and hardship damages and issued a total judgment in 2000 for $326 million, including $92 million for environmental remediation in particular (Nuclear Claims Tribunal, (n.d.)). The Tribunal, however, did not receive sufficient funding from the US to distribute this award.

In Australia, the cleanups were at first hastily directed by the British government, but then Australia, with some collaboration with the Aboriginal community, continued the work decades later after reports of persistent contamination, partly subsidized by the British government.

In Algeria, the French have done essentially nothing to clean up the site. At a 2019 conference, Algerian advocates renewed calls for France to complete environmental cleanup of the two areas (Algerie Presse Service, 2019).

Key takeaways

Dozens of identified sites around the world remain contaminated by nuclear weapons use, production and testing, and there is no one standard for their remediation. Notably, there is no widely accepted standard to determine how clean is clean, or how to monitor radiation levels over time. Speed and thoroughness of cleanup vary widely as well, and the cost to remediate each site ranges from millions of US$ to billions. Even remediated sites are often still somewhat closed to the public. The nuclear-armed states have historically done the most to direct and carry out the cleanup of sites, even if the test site is not under those states' jurisdiction. However, nuclear-armed states do not always respond to local requests for action.

Biographies

Nate Van Duzer worked as a research intern for the International Campaign to Abolish Nuclear Weapons in 2019 and holds 10 years of experience in local government and policy making. He received a Master of Global Affairs from the University of Notre Dame and a BA from Georgetown University.

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